

## CLAIMS

1. A virtual oven for stress testing a plurality of modules, comprising:
  - 5 a logical group of modules loaded into an environmental stress screening room wherein an environmental stress parameter of the environmental stress screening room changes over time;
  - a test equipment operatively connected to the modules of said logical group, said test equipment generating a test signal and capable of performing an active test of at least
  - 10 one of the modules of said logical group at a time; and
  - a controller operatively connected to said test equipment and to said logical group of modules;
  - said controller receiving results of the active test performed by said test equipment.
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2. The virtual oven for stress testing a plurality of modules according to claim 1, further comprising:
  - a switch interposed between said logical group of modules and said test equipment, said switch also having an operative connection with said controller;
  - 20 said controller periodically controlling said switch to supply the test signal from one of the modules of said logical group at a time to said test equipment such that said test equipment is time-shared between the modules of said logical group.

3. The virtual oven for stress testing a plurality of modules according to claim 2,  
said controller receiving passive test measurement values from at least some of  
the modules of said logical group;

5 said controller controlling said switch and said test equipment to perform the  
active testing of the modules on a time share basis wherein the active test is performed on  
a first one of the modules and, upon expiration of a first test period, said controller  
controls said switch and said test equipment to perform the active test on a second one of  
the modules.

10 4. The virtual oven for stress testing a plurality of modules according to claim 1,  
further comprising:

a memory device operatively connected to said controller, said memory device  
storing a database including the results of the active test.

15 5. The virtual oven for stress testing a plurality of modules according to claim 3,  
further comprising:

a memory device operatively connected to said controller, said memory device  
storing a database including the results of the active test and the passive test measurement  
values.

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6. The virtual oven for stress testing a plurality of modules according to claim 2,  
further comprising:

a second switch operatively connected to said test equipment and to said logical group of modules,

said controller periodically controlling said switch and said second switch to supply the test signal to and from said test equipment and one of the modules of said 5 logical group at a time such that said test equipment is time-shared between the modules of said logical group.

7. The virtual oven for stress testing a plurality of modules according to claim 1, further comprising:

10 a signal splitter operatively connected to said test equipment and to said logical group of modules, said signal splitter splitting the test signal and supplying the test signal to said logical group of modules.

8. The virtual oven for stress testing a plurality of modules according to claim 1, wherein the modules of said logical group are optical communication modules 15 and said test equipment performs an active optical test of the modules.

9. The virtual oven for stress testing a plurality of modules according to claim 8, wherein the active optical test is a bit error rate test.

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10. The virtual oven for stress testing a plurality of modules according to claim 1, said test equipment performing a series of tests of the modules.

11. The virtual oven for stress testing a plurality of modules according to claim 1,  
said controller sending a command to at least one module of said logical group to  
place that module in a desired operational state.

5 12. The virtual oven for stress testing a plurality of modules according to claim 1,  
further comprising:

a display unit operatively connected to said controller;

said controller generating displays of the active test results and supplying the  
generated displays to said display unit; and

10 said display unit displaying the generated displays.

13. The virtual oven for stress testing a plurality of modules according to claim 12,  
said controller receiving passive test measurement values from at least one of the  
modules of said logical group;

15 said controller analyzing the passive test measurement values and the active test  
results; and

said display unit displaying results of said controller's analysis.

14. The virtual oven for stress testing a plurality of modules according to claim 1,  
20 further comprising:

a network operatively connecting said test equipment with said controller, said  
memory device, and each of the modules of said logical group;

said controller controlling said network to route the test signal between one of the modules and said test equipment on a time-shared basis.

15. The virtual oven for stress testing a plurality of modules according to claim 1,

5 further comprising:

a plurality of said test equipment each of which generates a respective test signal

and is capable of performing an active test of one of the modules at a time;

a network operatively connecting said plurality of test equipment with said

controller, said memory device, and each of the modules of said logical group;

10 said controller controlling said network to route the test signals between said test

equipment and respective ones of said modules on a time-shared basis.

16. The virtual oven for stress testing a plurality of modules according to claim 1,

further comprising:

15 a plurality of logical groups of modules;

a plurality of said test equipment each of said test equipment being associated

with one of said logical groups, generating a respective test signal and capable of

performing an active test of one of the modules in the associated logical group at a time;

a network operatively connecting said plurality of test equipment with said

20 controller, said memory device, and each of said logical groups;

said controller controlling said network to route the test signals between each of

said test equipment and one of the modules of said logical groups,

wherein within each of said associated test equipment and said logical groups, said controller controls said network to route the test signals between said test equipment and a respective one of the modules in the associated logical group on a time-shared basis.

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17. A system including a plurality of virtual ovens according to claim 1, further comprising:

a network operatively connecting said virtual ovens and said memory device.

10 18. A system including a plurality of virtual ovens according to claim 1, further comprising:

an optical noise source generating an optical noise signal;

a coupler operatively connected to said optical noise source and to said test equipment and coupling the test signal and the optical noise signal to generate a noise-

15 loaded signal;

a variable optical attenuator operative coupled between said noise source and said coupler, said variable optical attenuator having a control input from said controller;

said controller adjusting an optical signal-to-noise ratio of the noise-loaded signal by controlling said variable optical attenuator;

20 wherein the noise-loaded signal is supplied to the logical group of modules.

19. A system including a plurality of virtual ovens according to claim 18, further comprising:

a second variable optical attenuator operatively coupled between said coupler and said logical group of modules;

an optical spectrum analyzer operatively coupled to said coupler and receiving the noise-loaded signal; said optical spectrum analyzer outputting a measurement value to  
5 said controller;

said controller utilizing the measurement value from said optical spectrum analyzer to control said first and/or second variable optical attenuators.

20. A method of performing stress testing of a plurality of modules, comprising:

10 designating a logical group of modules in an environmental stress screening room wherein an environmental stress parameter of the environmental stress screening room changes over time;

generating a test signal;

15 supplying the test signal to at least one of the modules of the logical group to subject the at least one module to an active test thereof; and receiving results of the active test from one of the modules of the logical group with a test equipment.

21. The method of performing stress testing a plurality of modules according to claim  
20, further comprising:

performing a series of tests of the logical group modules on a time-share basis with the test equipment.

22. The method of performing stress testing a plurality of modules according to claim  
21, further comprising:

receiving passive test measurement values from at least one of the modules of the  
logical group.

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23. The method of performing stress testing a plurality of modules according to claim  
22, further comprising:

storing results of the active test and the passive test measurement values for each  
of the modules in a database.

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24. The method of performing stress testing a plurality of modules according to claim  
20, further comprising:

splitting the test signal and supplying the test signal to the logical group of  
modules.

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25. The method of performing stress testing a plurality of modules according to claim  
20, further comprising:

periodically supplying the test signal from one of the modules to the test  
equipment such that the test equipment is time-shared between the modules of the logical  
group.

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26. The method of performing stress testing a plurality of modules according to claim  
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wherein the modules are optical communication modules and the active test is an active optical test of the modules.

27. The method of performing stress testing a plurality of modules according to claim

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wherein the active optical test is a bit error rate test.

28. The method of performing stress testing a plurality of modules according to claim

20, further comprising:

10 sending a command to at least one module of the logical group to place that module in a desired operational state.

29. The method of performing stress testing a plurality of modules according to claim

20, further comprising:

15 displaying the active test results.

30. The method of performing stress testing a plurality of modules according to claim

20, further comprising:

receiving passive test measurement values from at least one of the modules of the  
20 logical group;

analyzing the passive test measurement values and the active test results; and

displaying results of said analyzing step.

31. The method of performing stress testing a plurality of modules according to claim  
20, further comprising:

networking the test equipment, the database and each of the modules of the  
logical group;

5 controlling the network to route the test signal between the test equipment and  
one of the modules of the logical group.

32. The method of performing stress testing a plurality of modules according to claim  
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10 said designating step designating a plurality of logical groups of modules in the  
environmental stress screening room;

the method further comprising:

networking a plurality of test equipment and each of the logical groups;

associating each of the test equipment with one of the logical groups; and

15 controlling the network to route the test signals between each of the test  
equipment and an associated one the logical groups.

33. A method of asynchronously conducting stress testing on a plurality of groups  
modules according to claim 20, wherein the logical group of modules is a first logical  
20 group of modules and the test equipment is a first test equipment, the method comprising:  
designating a second logical group of modules in the environmental stress  
screening room;

asynchronously initiating testing of the first and second logical groups of modules;

testing the first logical group of modules with the first test equipment; and

testing the second logical group of modules with a second test equipment,

5 wherein each of said testing steps respectively includes said generating step, said supplying step, and said receiving step.

34. The method of performing stress testing a plurality of modules according to claim  
20,

10 adding optical noise to the test signal to generate a noise-loaded signal;

adjusting an optical signal-to-noise ratio (OSNR) of the noise-loaded signal;

supplying the OSNR-adjusted, noise-loaded signal to the logical group of  
modules.

15 35. The method of performing stress testing a plurality of modules according to claim  
34,

adjusting a power level of the OSNR-adjusted, noise loaded signal before it is  
supplied to the logical group of modules.